FURUNO

OPERATOR'S MANUAL

PRINTER

MODEL   PP-505

(For FE-700)

FURUNO ELECTRIC CO., LTD.

NISHINOMIYA, JAPAN

⚠ SAFETY INSTRUCTIONS

Safety Information for Operator

⚠ WARNING

Do not open the cover of the equipment.

This equipment uses high voltage electricity which can shock or burn.
Only qualified personnel should work inside the equipment.

Do not disassemble or modify the equipment.

Fire, electrical shock or serious injury can result.

Immediately turn off the power at the ship's mains switchboard if water or foreign object falls into the equipment or the equipment is emitting smoke or fire.

Continued use of the equipment can cause fire, electrical shock or serious injury.

⚠ CAUTION

Do not place liquid-filled containers on the top of the equipment.

Fire or electrical shock can result if a liquid spills into the equipment.

Do not place heater near the equipment.

Heat can melt the power cord, which can result in fire or electrical shock.

Do not operate the unit with wet hands.

Electrical shock can result.

Use the correct fuse.

Use of the wrong fuse can cause fire or damage the equipment.

Safety Information for Installer

⚠ WARNING

ELECTRICAL SHOCK HAZARD Only qualified personnel should work inside the equipment.

This equipment uses high voltage electricity which can shock or burn.

Turn off the power at the ship's mains switchboard before beginning the installation. Post a warning sign near the switchboard to ensure that the power will not be applied while the equipment is being installed.

Serious injury can result if the power is not turned off, or is applied while the equipment is being installed.

⚠ CAUTION

Observe the following compass safe distances to prevent interference to a magnetic compass:

	standard compass	steering compass
PP-505	1.1 m	0.8 m

WARNING LABEL

A warning label is attached to the printer. Do not remove the label. If the label is missing or damaged, contact your dealer about replacement.

⚠ WARNING ⚠
To avoid electrical shock, do not remove cover. No user-serviceable parts inside.
⚠   ⚠
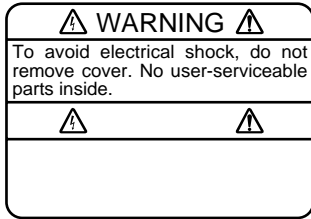
Name: Warning Label (1)
Type: 86-003-1011
Code No.: 100-236-231

FOREWORD

A Word to the Owner of the PP-505

Congratulations on your choice of the FURUNO PP-505 Printer.

For over 50 years FURUNO Electric Company has enjoyed an enviable reputation for innovative and dependable marine electronics equipment. This dedication to excellence is furthered by our extensive global network of agents and dealers.

Your printer is designed and constructed to meet the rigorous demands of the marine environment. However, no machine can perform its intended function unless installed, operated and maintained properly. Please carefully read and follow the recommended procedures for installation, operation and maintenance.

We would appreciate hearing from you, the end-user, about whether we are achieving our purposes.

Thank you for considering and purchasing FURUNO equipment.

The PP-505 prints a depth graph or a log consisting of date, time, depth, draft, latitude, longitude and heading.

You can choose which to print with the [MODE] key.

The main features are
- Automatic operation; just turn on the power and the printer readies itself for printing.
- Selectable printing interval.
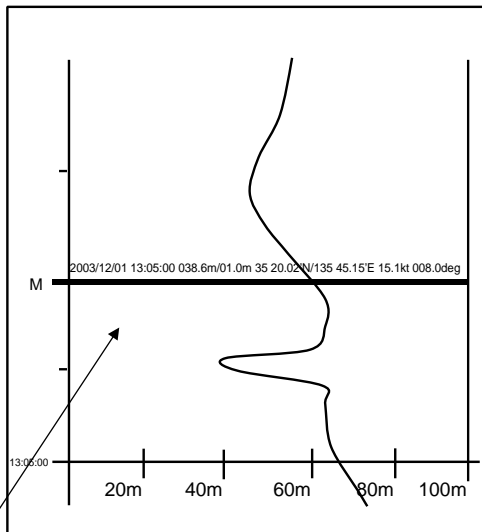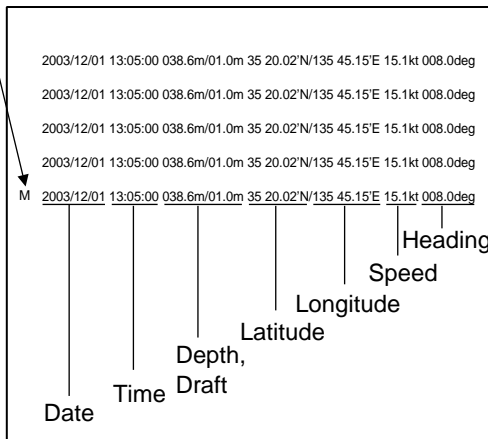- LEDs show equipment status.

TABLE OF CONTENTS

1. OPERATION

1.1 General

Operation of the PP-505 is simple; just turn on the power. The depth graph or the log, whichever is selected for printing, is printed out at the interval set.
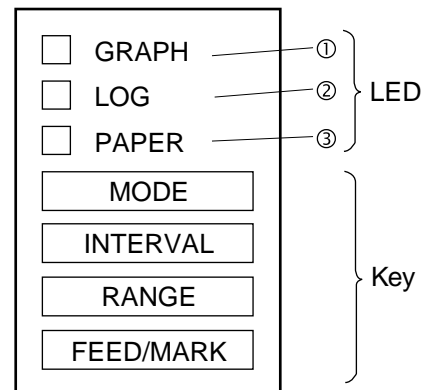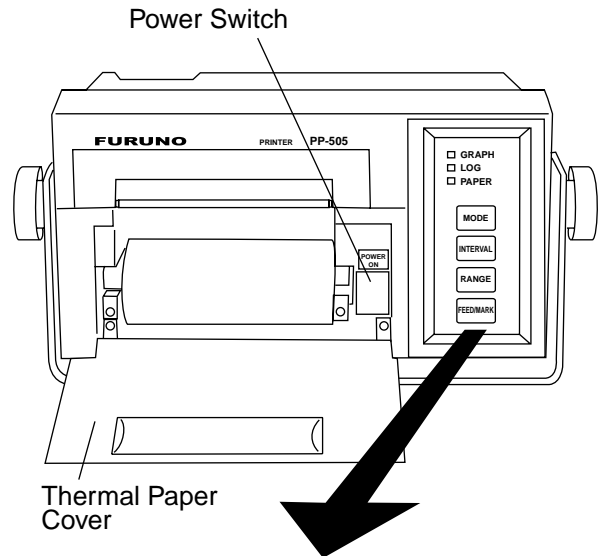
Below are example printouts.

Marker

Depth graph

Heading
Speed
Longitude
Latitude
Depth, Draft
Time
Date

Depth data log

1.2 Panel

Power Switch

Thermal Paper Cover

① GRAPH
② LOG } LED
③ PAPER

MODE
INTERVAL } Key
RANGE
FEED/MARK

Indicators

There are three (red) LEDs on the front panel which light or blink according to equipment status.

① GRAPH

Lights while the depth graph is being printed.

② LOG

Lights while the depth data log is being printed.

③ PAPER

Blinks when the paper has run out, and is accompanied by the audible alarm. The audible alarm sounds for five seconds; you may silence it sooner by hitting any key.

Changing the mode

Press the [MODE] key to change the printing mode from depth graph to log printing alternately.

The printing interval setting is printed whenever the [MODE] key is pressed.

Changing the printing interval

Press the [INTERVAL] key to choose printing interval.

Depth graph: 9 s → 45 s → 90 s → 450 s
Log: 10 s → 30 s → 1 m → 10 m

The latest data of the printing interval is printed.

When the printing interval is changed, the printing interval setting is printed and marked with an asterisk.

Note: You can skip over setting(s) by pressing the key consecutively within one second.

Changing the depth range

Press the [RANGE] key to change the depth range.

When the depth range is changed, the depth is printed and marked with an asterisk.

Range: 5 m → 10 m → 20 m → 40 m → 100 m → 200 m → 400 m→ 800 m

Note1: Depth range automatically changes depending on the depth range on the navigational echo sounder.
Note2: You can skip over setting(s) by pressing the key consecutively within one second.

Feeding the paper/Printing the marker

To feed the paper, press and hold down the [FEED/MARK] key.

Press the [FEED/MARK] key momentarily to print the marker.

1.3 Turning on the Power

Flip down the thermal paper cover and turn on the [POWER] switch. The PP-505 then carries out the diagnostic test. After the test has been completed, the printer is ready to print depth data.

Note: "Disconnect" is printed if data from the navigation echo sounder is not being received during printing or the navigation echo sounder is displaying the system menu.
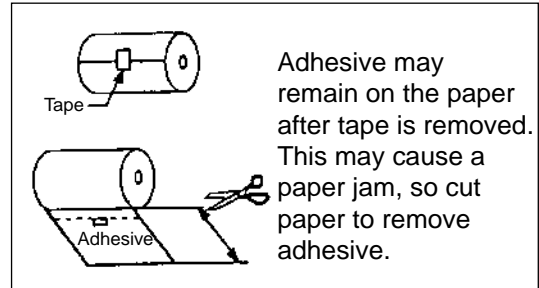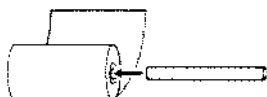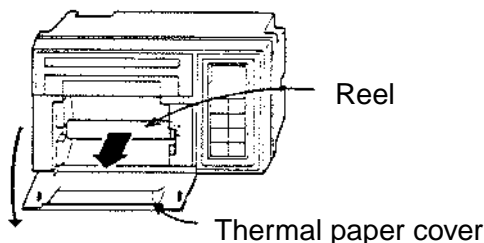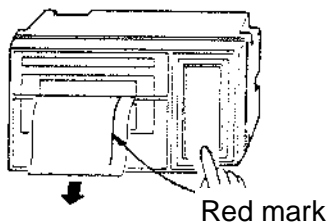
To turn off the power, press the [POWER] switch.

2. REPLACEMENT OF THERMAL PAPER

When the thermal paper runs out, the PAPER LED blinks, printing stops automatically and the audible alarm sounds for five seconds. With 1 m of paper remaining, a red paper end mark appears on the paper. When the red mark appears, replace the thermal paper as shown in the procedure below.

> REQUIRED THERMAL PAPER
> Type: TP0340 (112 mm × 40 m)
> Code No.: 000-801-765
> (One roll supplied.)

1. Press the [FEED/MARK] key to draw out the remaining thermal paper.
2. Pull the thermal paper cover forward and take out the paper spool.
3. Curve the leading edge of the new roll paper to ensure smooth feeding, and set the paper spool to the new roll paper.

Red mark

Reel

Thermal paper cover

Tape

Adhesive

Adhesive may remain on the paper after tape is removed. This may cause a paper jam, so cut paper to remove adhesive.

4. Insert the paper into the paper insertion slot just above the paper container and press the [FEED/MARK] key to feed out the paper.
5. Set the paper in the paper container.

Confirm that paper is fed out through the slot.

Insertion slot
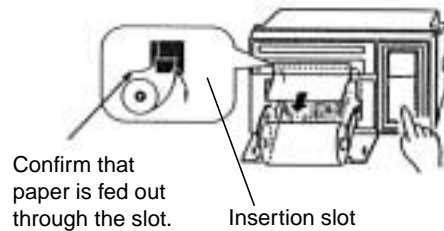
6. Press the [FEED/MARK] key to confirm that the paper is properly aligned. If the paper comes out with its edges wrinkled, continue to press the [FEED/MARK] key. Correct alignment will be made automatically.
7. Close the thermal paper cover.
8. Press the [MODE] key to complete the replacement of thermal paper. (The PAPER LED goes off.)

Note: If the PP-505 receives data when there is no paper it doesn't print them out after replacing the thermal paper.

Remedy for paper jam

If the paper is jammed cut it off at the front panel and rewind it into the paper container.

3. INSTALLATION

3.1   Complete Set

Name	Type	Mass	Qty	Remark
Main Unit	PP-505	3.1 kg (with hanger)	1	
Spare Parts	SP08-01600		1	
Installation Materials	CP16-00800		1	
Accessories	FP08-00500		1	
Flush Mount Kit	OP08-4		1	Option (004-511-330)

3.2   General Mounting Considerations

This equipment can perform its intended functions only if it is installed properly. Keep in mind the following when selecting a mounting location.

Water spray

The PP-505 is designed and constructed to be able to withstand the humidity and corrosive atmosphere common to the pilothouse, but it is not designed to be used outside, directly exposed to the environment. Salt water spray will most assuredly cause damage to the sensitive components inside.

Mechanical shock and vibration

The PP-505 is constructed to withstand minor shocks and engine vibration, but excessive and continued shock can shorten the life of the precision printer mechanism. Shock may also degrade the print quality due to uneven contact between the printer head and the thermal paper.

Heat accumulation

The PP-505 consumes very little power, so there is no need for forced air ventilation. However, it is recommended to provide at least some space around the unit to allow for circulation of cooling air.

The unit should be kept out of direct sunlight because of heat that can build up inside the cabinet. Excessive heat can darken the thermal paper.

Onboard noise

To avoid mutual interference with other power equipment, do not install this unit near a power cable or equipment having a motor.

Compass safe distance

A magnetic compass will be affected if the printer is placed too close to the compass. Observe the following compass safe distances to prevent deviation to the compass.

Standard: 1.1 m
Steering: 0.8 m

3.3 Tabletop/Bulkhead Mount

The main unit can be mounted on a desktop, bulkhead, or in a panel. Make sure the selected location is strong enough to support the main unit against possible vibration and shock. If necessary, appropriate reinforcement measures should be made on the mounting area.
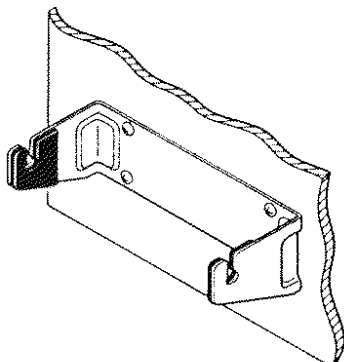
Tabletop mount

1. Drill four pilot holes for the hanger.
2. Fix the hanger with the tapping screws (5×20) supplied.
3. Place the unit in the hanger and tighten knobs.
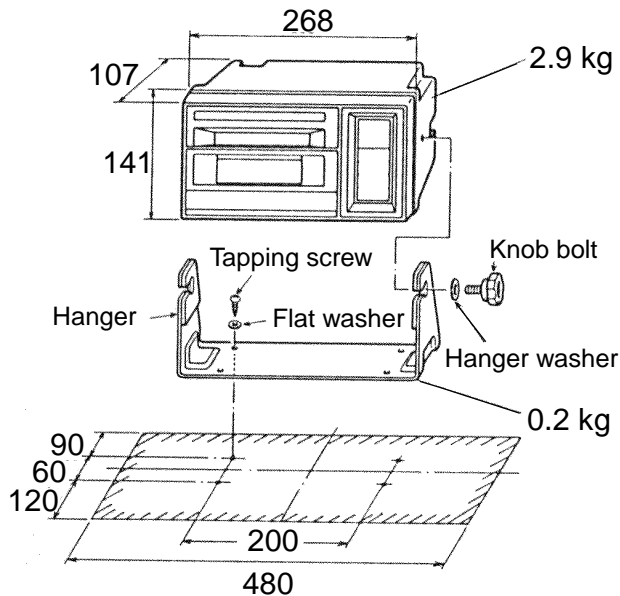
Bulkhead mount

When the unit is installed on the bulkhead, fix the hanger as shown below.

3.4 Flush Mount

Flush mount panel kit is optionally supplied.

**Flush mount kit OP08-4
(Code No.: 004-511-330)**

Name	Type	Code No.	Qty
Flush mount panel	22-008-0125	100-103-351	1
Tapping screw	5X20	000-800-488	4
Nylon washer	2.8X7X0.5	000-800-728	4
Pan head screw	M3X8	000-861-495	4
Hex. bolt	M8X16	000-862-145	2
Flat washer	M5	000-864-128	4
Flat washer	M8	000-864-130	2
Spring washer	M8	000-864-262	2
Rosette washer	M3	000-864-900	4
Flush mount angle	22-008-0126	100-103-361	2
Liner	22-008-0127	100-103-371	2

3. INSTALLATION

1. Referring to the illustration below, prepare a cutout in the mounting area and drill four pilot holes for the flush mount angles.

   Refer to the outline drawing at end of manual.
2. Fix the liner and the flush mount angles to the main unit.
3. Connect the cables at the rear of main unit.
4. Fix the main unit to the panel cutout with four tapping screws.
5. Fix the flush mount panel to the flush mount angles with the screws and washers supplied.

3.5   Wiring

Refer to the interconnection diagram at end of manual for connection.
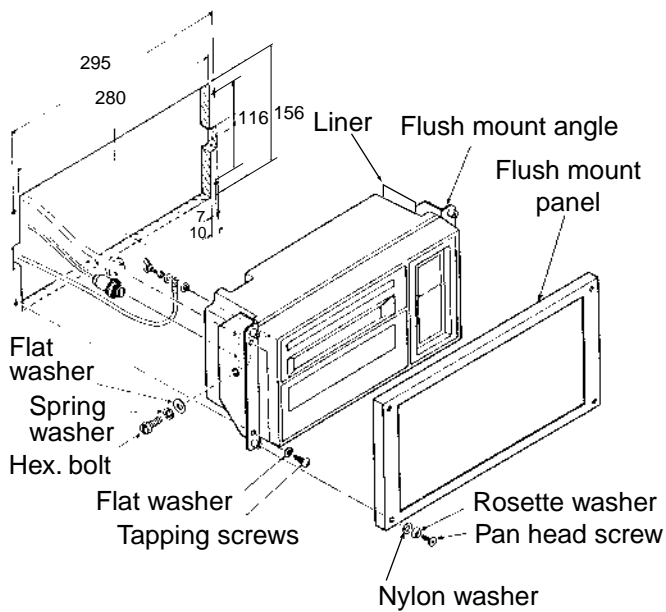
4. MAINTENANCE

Checking the power connector

Check for loosened or disconnected power connector.

⚠️ **WARNING**

⚡ **Do not open the cover of the equipment.**

This equipment uses high voltage electricity which can shock or burn.
Only qualified personnel should work inside the equipment.

Do not disassemble or modify the equipment.

Fire, electrical shock or serious injury can result.

Diagnostic test

When turning on the power, if any fault is detected, the appropriate LED lights.

GRAPH: ROM error
LOG: RAM1 error
PAPER: RAM2 error

If any LEDs light, contact your dealer.

Cleaning

Accumulated dust should be regularly removed from both exterior surfaces and the interior. The only recommended cleaning material for exterior surfaces is a soft cloth. For the interior, use a handheld vacuum. BE SURE TO TURN OFF THE POWER BEFORE CLEANING THE INSIDE OF THE UNIT. Do not use chemical-based cleaners to clean the display unit-they can remove paint and markings.
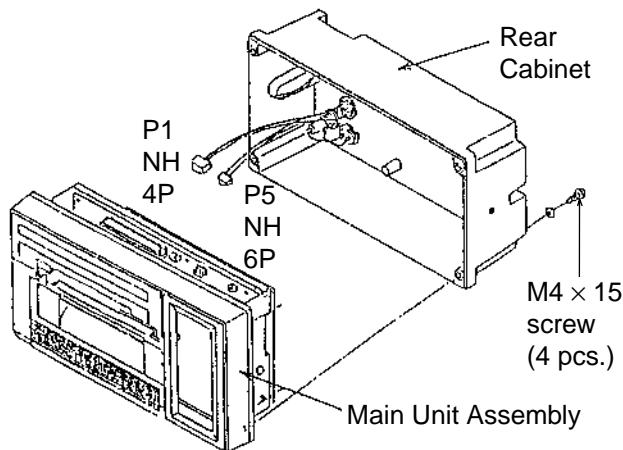
Fuse Replacement

To protect the equipment from serious damage, a 3A fuse is provided on the rear cabinet of the main unit. The fuse protects against overvoltage/reverse polarity of the ship's mains or internal fault of the equipment. If the fuse has blown, first find out the cause of the trouble before replacing it. A fuse rated for more than 3 A should not be used, since it may permanently damage the equipment. Damage due to overfusing is not covered by the warranty.
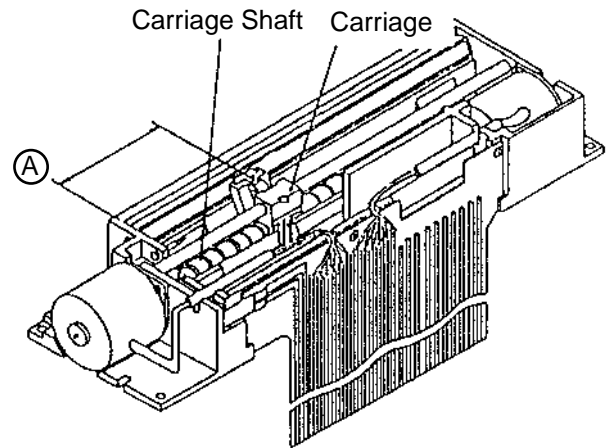
⚠️ **CAUTION**

Use the correct fuse.

Use of the wrong fuse can cause fire or damage the equipment.

# APPENDIX   REPLACEMENT OF PRINTER ASSEMBLY/TERMAL HEAD

1. Loosen the four M4 × 15 screws fixing the rear cabinet to the main unit assembly.

2. Disconnect the connectors connected to the rear cabinet to detach the rear cabinet.


Rear Cabinet

P1 NH 4P

P5 NH 6P

M4 × 15 screw (4 pcs.)

Main Unit Assembly

3. Separate the panel assembly from the main unit assembly by removing the recording paper from the paper container.

Main Unit Assembly

Printer Assembly

PANEL CPU Board

P4 PH 12P

P8 PH 10P

P10 PH12P

M4 × 8 screw (4 pcs.)

Do not Disconnect.

Panel Assembly

4. Move the carriage to position Ⓐ by rotating the carriage shaft by fingers, as shown below, where the thermal head assembly can be replaced easily.

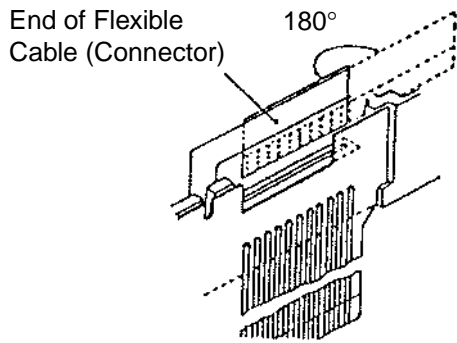Carriage Shaft   Carriage

Ⓐ
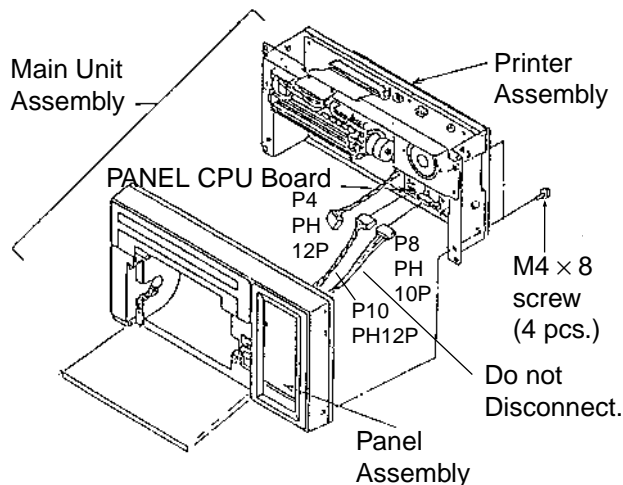
5. Remove the flexible cable support from the carriage by lifting it toward direction Ⓑ as in the figure below.

Ⓑ   Flexible Cable Support

Carriage
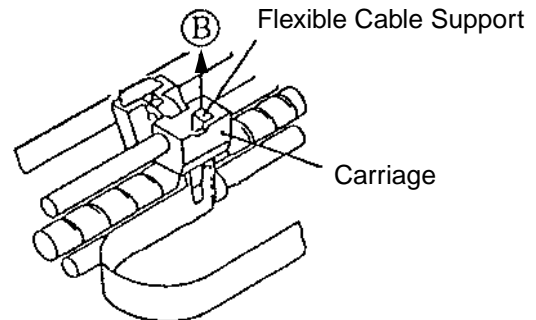
6. Pull out the connector end of the flexible cable from the connector. Take care not to damage the flexible cable.

End of Flexible Cable (Connector)   180°

7. Remove the thermal head from the head holder with a screwdriver as shown below, and then take the thermal head assembly out of the printer assembly.

Thermal Head

Screwdriver

Head Holder
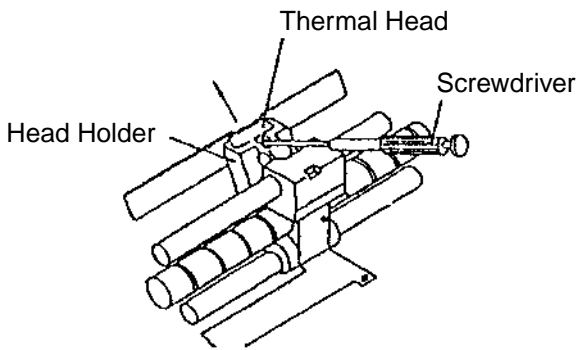
8. As shown below, pass the flexible cable (connector side) of a new thermal head assembly beneath the guide pins.

End of Flexible Cable

Guide Pin
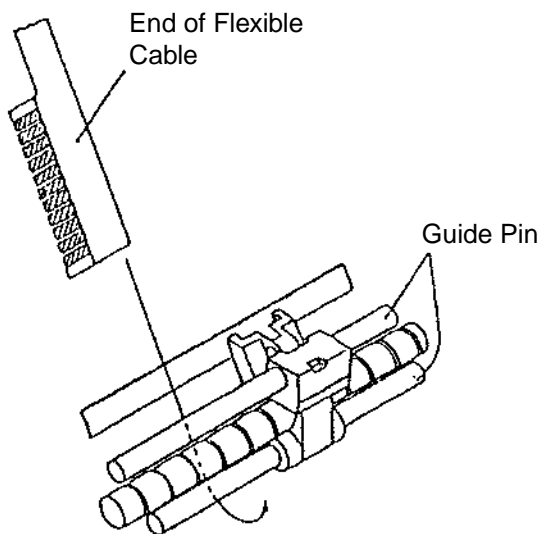
9. Hold the flexible cable end with a tweezers and pull it out until it is positioned as shown below.

Head Holder

90°

Thermal Head
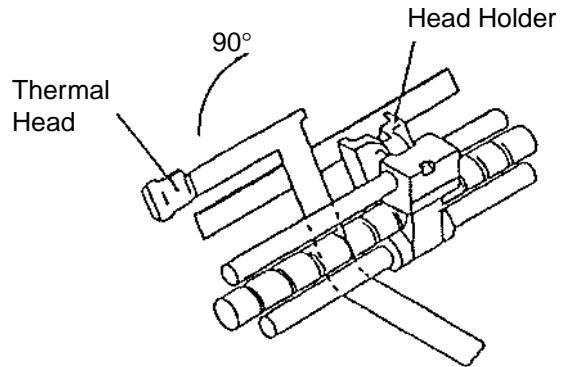
10. Turn the head by 90° so that it is parallel with the head holder as shown below. While pulling the head holder toward you, insert the head into the head holder.

Head Holder

Head

Carriage

Projection

Hole
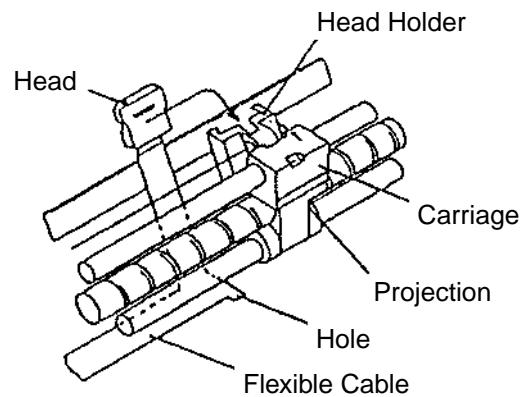
Flexible Cable

11. Fix the flexible cable to the carriage with the flexible cable support, inserting the projection on the carriage into the hole of the cable.

Flexible Cable Support

Carriage

Projection
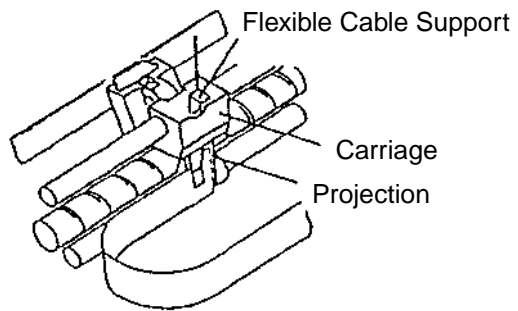
12. Fold back the end of the cable and insert it into the connector.

180°

End of Flexible Cable

AP-3

FURUNO
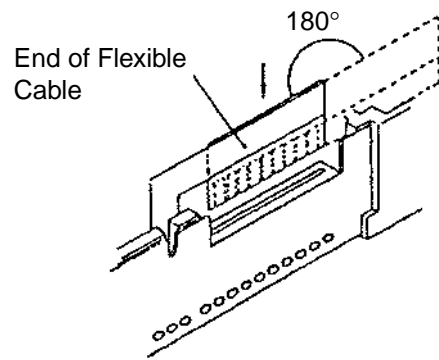
SPECIFICATIONS OF PRINTER
PP-505

1   DATA FORMAT

1.1	Receiving System	RS-232C
1.2	Speed	9600 bps
1.3	Data Length	8 bits
1.4	Parity	Non
1.5	Stop Bit	1 bit

2   PRINTER SECTION

2.1	Printing System	9 dots serial thermal head printing system
2.2	Character	Alphanumeric
2.3	Dot Pitch	0.28 mm/ dot
2.4	Number of Dot in Line	300 dots
2.5	Number of Characters	Max. 80 characters/ line
2.6	Print Speed	31 characters/second
2.7	Roll Paper	TP-0340, 112 mm (W) x 40 m (L)

3   RATED VOLTAGE/CURRENT

12-32 VDC, 0.72-0.28 A

4   ENVIRONMENTAL CONDITION

4.1	Ambient Temperature	-15°C to +55°C
4.2	Relative Humidity	95% at 40°C
4.3	Waterproofing	IPX0
4.4	Vibration	IEC 60945

5   COATING COLOR

Chassis: 2.5GY5/1.5, Panel: N3.0

E5540S03-1

16AD-X-9851-1

PACKING LIST
PP-505/PP-505HK

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
EGC プリンター EGC PRINTER		PP-505 000-055-887	1

予備品
SPARE PARTS

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ミゼットヒューズ FUSE		FGMB 3A 125V 000-104-909	2
記録紙 RECORDING PAPER		08S0166 TP0340 112mm × 40m 000-801-765	1

工事材料
INSTALLATION MATERIALS

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
コネクタ CONNECTOR		FM-14-7P 000-108-138	1
コネクタ CONNECTOR		17JE-23090-02 000-132-624	1
アース線 GROUNDING WIRE		08S0087-0 000-108-138	1
ケーブル組品 CABLE ASSY.		08S0157-2 000-116-030	1

付属品
ACCESSORIES

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ハンガー組品 HANGER ASSY.		FP08-00510 004-511-550	1
ノブボルト KNOB BOLT		KG-B2 M8×20 SUS 000-801-738	2
ハンガーワッシャー HANGER WASHER		05-029-0132 100-087-911	2
+ナベタッピンUIネジ TAPPING SCREW		5 ×20 SUS304 000-800-488	4
ミガキ平座金 FLAT WASHER		M5 SUS304 000-864-128	4

C5540-Z01-B

FURUNO

表 1 TABLE 1

寸法区分（mm） Dimensions	公差（mm） Tolerance
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

4-φ7.5（取付穴）
FIXING HOLE
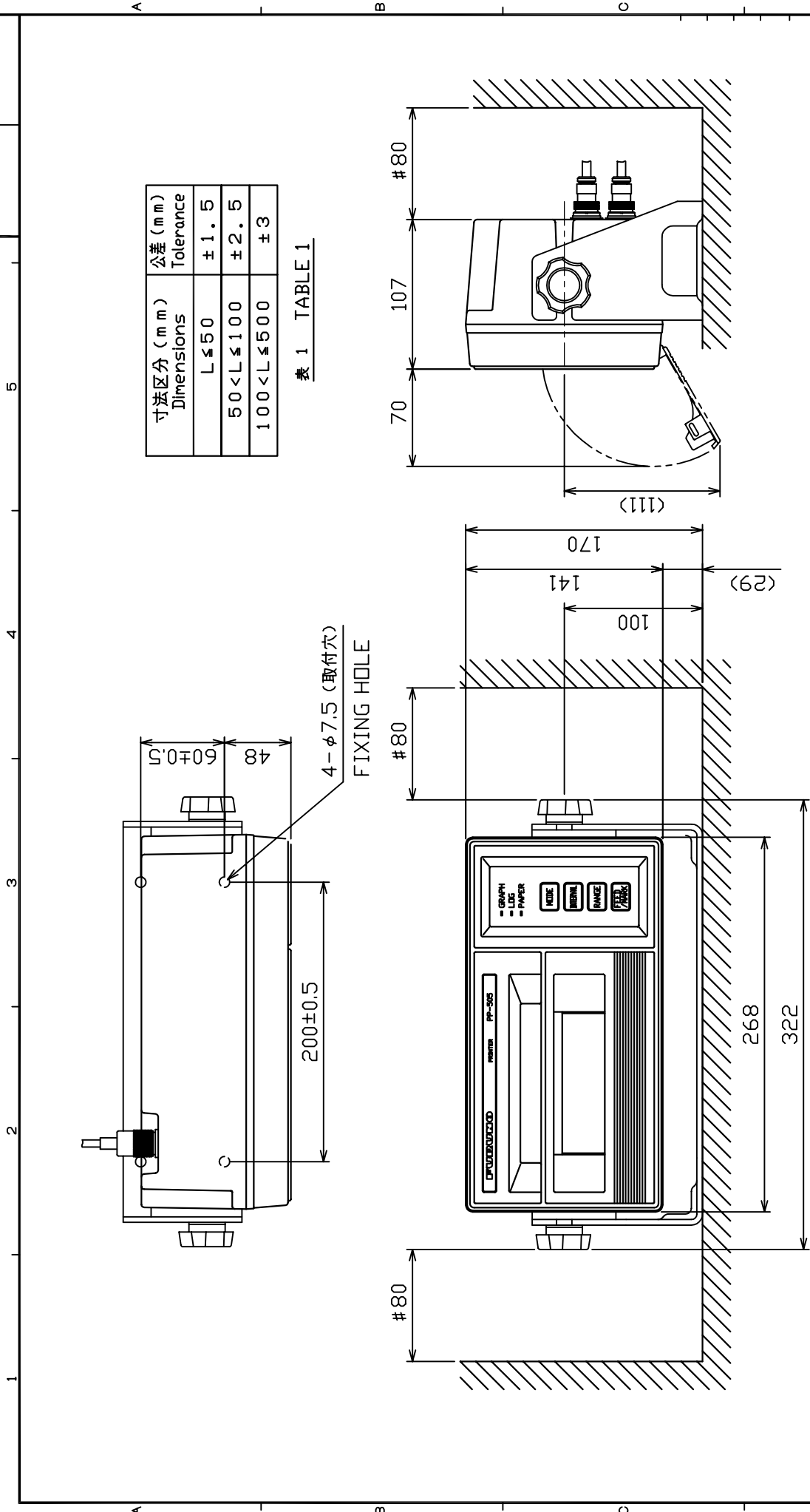
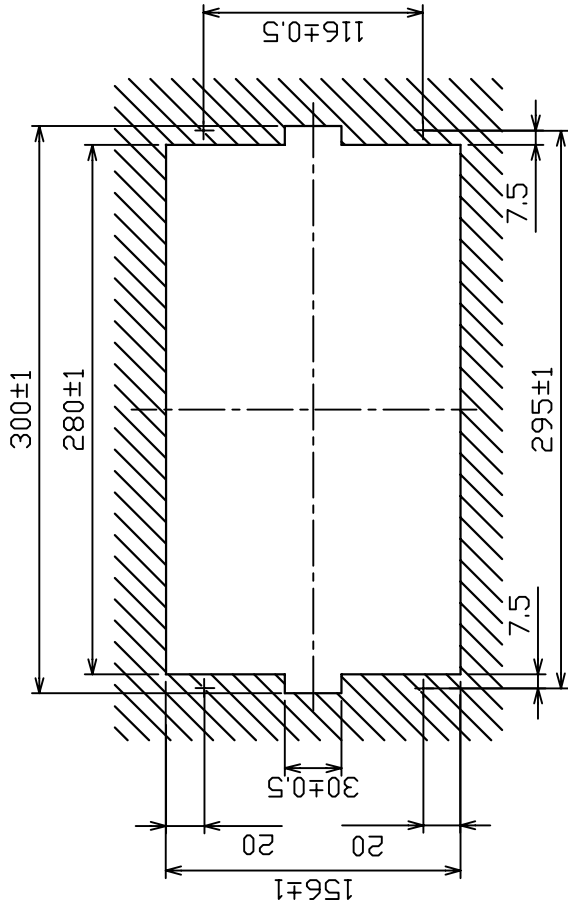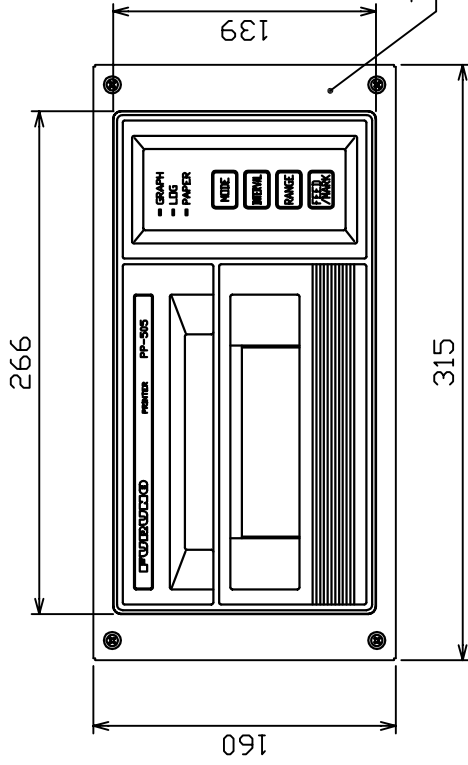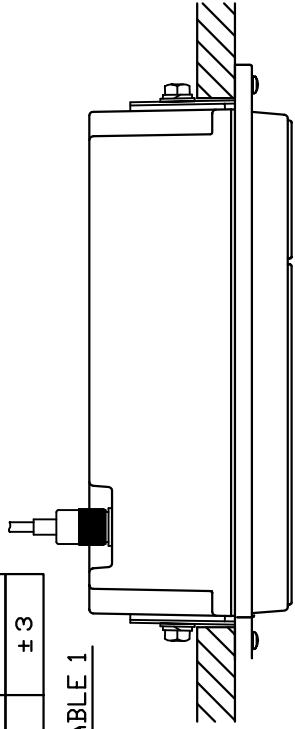注 記   1) #印寸法は最小サービス空間寸法とする。
        2) 指定外の寸法公差は表1による。

NOTE 1) #: RECOMMENDED SERVICE CLEARANCE.
      2) TABLE 1 INDICATES TOLLRANCE OF DIMENSIONS.

DRAWN	July. 23 2003	H. MAKI		TITLE	PP-505		FURUNO ELECTRIC CO., LTD.
CHECKED	Takahashi T.			名称	プリンタ		
APPROVED	Takahashi T.		FE-700	NAME	外寸図（卓上装備）		
SCALE	1/4	MASS 2.9 ±10% kg			PRINTER (TABLETOP MOUNT) OUTLINE DRAWING		
DWG No.	C2366-G10-A	16-010-005G					

FURUNO

116±0.5

300±1
280±1

7.5

295±1

取付穴寸法図
CUTOUT DIMENSIONS

7.5

30±0.5

20
20
156±1

FLUSH MOUNT PANEL
フラッシュマウントパネル

139

266

315

160

FIXING CHASSIS
フラッシュマウントシャーシ

154

77

219

70

191

寸法区分 (mm) Dimensions	公差 (mm) Tolerance
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
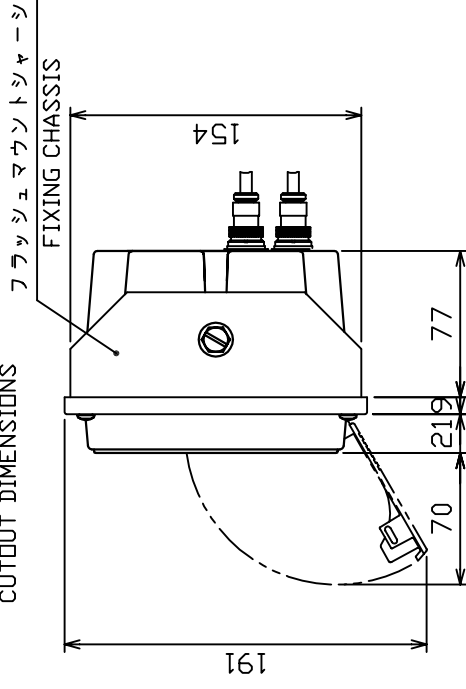
表 1 TABLE 1

注 記 1) 指定外の寸法公差は表1による。

NOTE 1) TABLE 1 INDICATES TOLLRANCE OF DIMENSIONS.

DRAWN	July. 23 2003	H. MAKI	TITLE	PP-505
CHECKED		Takahashi T.	名称	プリンタ (埋込装備)
APPROVED		Takahashi T.		外寸図
		FE-700	NAME	PRINTER (FLUSH MOUNT) OUTLINE DRAWING
SCALE	1/4	MASS 2.9 ±10% kg		16-010-015G-0
DWG. No.	C2366-G11-A			

FURUNO ELECTRIC CO., LTD.

FURUNO

DISTRIBUTION BOX
FE-702

TB1
4 EIA232-TD
5 EIA232-RD
6 GND

CO-SPEVV-SD-CO. 2x2P, 13.5 *1

*2

P
P

FM4-7P

RXD (H) 1
TXD (H) 2
0V 3
TXD (C) 4
RXD (C) 5
+12V 6
N.C 7

*4

PRINTER
PP-505

08S0087

FM4-2P
1
2
*3

SHIP'S MAINS
12-32 VDC   08S0157
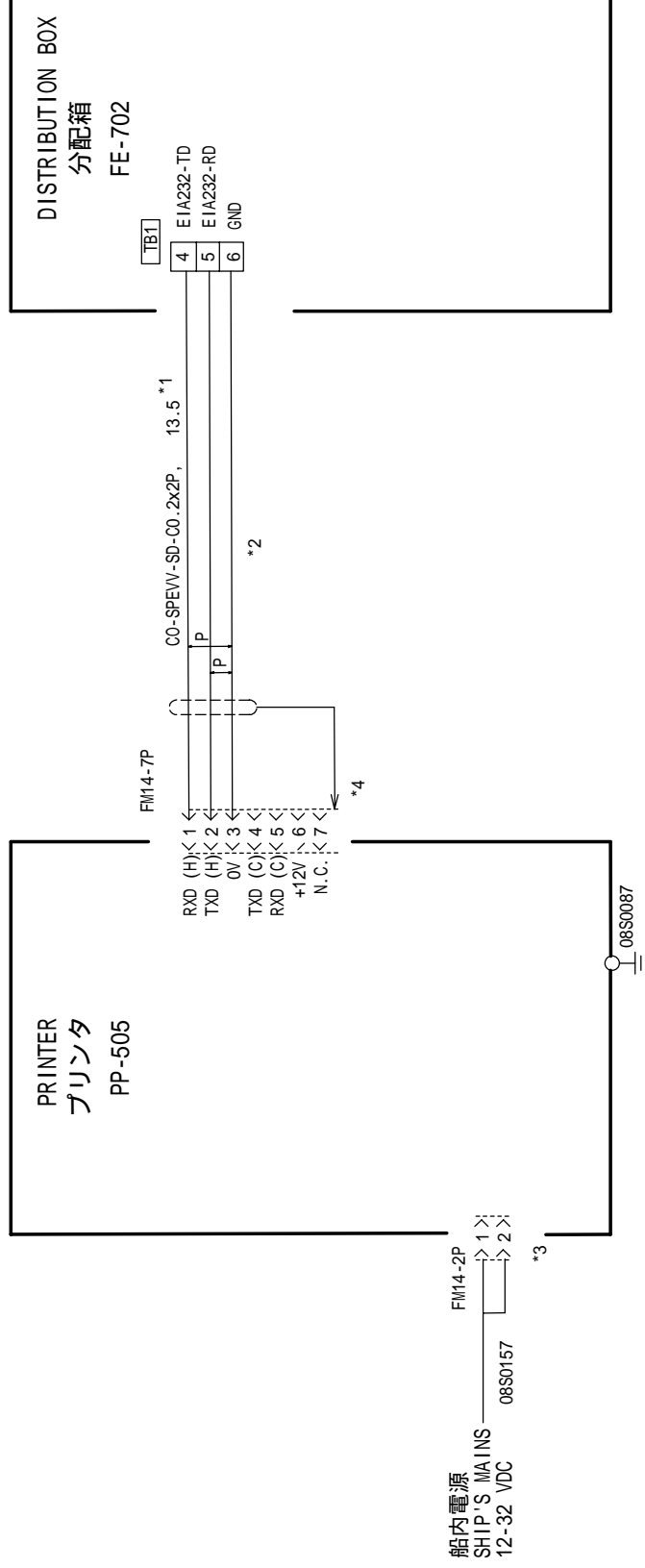
NOTE
1. LOCAL SUPPLY.
2. MAX 15m
3. FITTED AT FACTORY.
4. GROUNDING WITH CONNECTOR HOUSING

1)
2   15m
3)
4)

DRAWN JULY. 23.2003 H. Maki
CHECKED Takahashi T.
APPROVED Takahashi T.

TITLE PP-505

NAME PRINTER
INTERCONNECTION DIAGRAM

FE-700

DWG.No C2366-C03-A   16-006-3022-0

FURUNO ELECTRIC CO.,LTD.